

INVESTIGATION TEAM

Secretary Babbitt directed the National Interagency Fire Center to form a Fire Investigation Team to review the circumstances of the planning and implementation of the Cerro Grande Prescribed Fire (**Appendix 1**). The Director of the National Park Service Robert Stanton signed the delegation of authority for the team on May 12, 2000. **Appendix 2** is a list of team members and functions. The team was given a specific purpose and scope to fulfill by May 18, 2000.

Purpose and Objectives

The team's purpose was to investigate and report on the circumstances associated with the planning and implementation with the planning and implementation of the Cerro Grande Prescribed Fire in Bandelier National Monument in New Mexico, and determine if overall National Park Service guidance and procedures were followed. The team examined and reported on events and circumstances that occurred during May 4-8, 2000, which was the period beginning with the planning and implementation of the prescribed fire to the transition to the Type 1 Interagency Incident Management Team. **Appendix 3** is the Upper Frijoles Units 1 and 5 Prescribed Fire Plan, and **Appendix 4** is the Wildland Fire Situation Analysis.

Specific objectives for the investigation were to determine:

- If the prescribed fire plan was adequate given the complexity, objectives, and environmental conditions, and if it complied with guidance set forth in Director's Orders-18 and Reference Manual-18, which are NPS documents for policy and direction on fire management.
- If the prescription, actions, and procedures set forth in the prescribed fire plan were followed.
- If prescribed fire training and experience of personnel involved were commensurate with agency qualification standards.
- Recommendations for immediate and long-term actions to prevent similar future occurrences and improve program performance.

Process

As directed in the delegation of authority, the Fire Investigation Team followed National Park Service procedures as described in Chapter 13, Evaluation and Review, Reference Manual-18 (USDI National Park Service 1998a). Team members completed the assignment using the following processes:

- Identified, collected, and analyzed the factual data associated with the planning, implementation, and escape of the prescribed fire through its redesignation as a wildland fire and management by the Type 1 Incident Management Team.
- Completed technical analyses of weather, climate, fuels, and fire behavior factors.
- Conducted interviews with key personnel involved with planning and implementation of the

prescribed fire and its conversion to a wildland fire.

- Prepared an investigation report.

Scope of Investigation

The report centers on the series of events from May 4-8, 2000, regarding the planning, implementation, and escape of the prescribed fire through its redesignation as a wildland fire. It also covers the transition from the local management team to the Type 1 Incident Management Team.

The investigation report is intended as an objective factual account. The findings of the Investigation Team will be reported to an Independent Review Board appointed by Secretary Babbitt. The Independent Review Board will review the findings and recommendations presented in the Cerro Grande Fire Investigation Report.

Team Composition

The Fire Investigation Team was an interagency team composed of representatives of the Bureau of Land Management, USDA Forest Service, National Park Service, National Weather Service, Department of Energy, Bureau of Reclamation, and New Mexico Energy, Minerals, and Natural Resources Department of Forestry Division. The team worked with local counties and tribal governments who served as liaisons to the team. Those governments involved included the counties of Rio Arriba, Santa Fe, and Sandoval, and the Pueblos of San Ildefonso and Santa Clara.

NATIONAL PARK SERVICE FIRE MANAGEMENT

The Organic Act of 1916 founded the National Park Service with the mission to perpetuate natural conditions and processes, preserve cultural resources, and provide for public enjoyment, as specified by the enabling legislation and other legal mandates. The agency has an overriding conservation mission rather than multiple use.

From 1916 to 1968, national policy was strictly to suppress all fires. Officially all fires, whatever their size or origin, were considered wildfires and suppressed as quickly as possible. The fact that the presence of fire and other natural disturbances was essential and normal for plant and animal communities was recognized. Further evidence showed that lack of fire was a major contributor to increasing fuel accumulations, especially in forest communities. Everglades National Park began researching controlled burns in the 1950s. The Leopold Report (Leopold et al. 1963) underscored the importance of restoring ecological processes. In response to that report, NPS fire management policy changed dramatically in 1968. Naturally ignited fires were recognized as “natural phenomena” and use of prescribed fire was accepted as a means of achieving resources and fuel reduction objectives. During the past 30 years the national program has developed in recognition of the complexity of fires on the landscape and the professional skills needed for fire management.

National Fire Program

Wildland fire management activities are essential to protect human life, personal property, and irreplaceable natural and cultural resources, and to accomplish the NPS mission. Interagency recognition of risks and expenses associated with wildland fire management culminated in the Federal Wildland Fire Management Policy and Program Review (USDA Forest Service and DOI 1995). The Secretary of the Interior has accepted and endorsed the principles, policies, and recommendations in the report, and has directed the NPS to implement them.

There is a hierarchy of authorities and plans associated with wildland fire. The NPS Organic Act of 1916 mandates conservation of resources processes. NPS Management Policies, Director’s Orders-18, and Reference Manual-18 are national level direction. Parks prepare individual fire management plans with environmental compliance, and the prescribed fire plan is a subordinate document.

NPS Management Policies.

NPS Management Policies (USDI National Park Service 2000a) for wildland fire management were revised in 1998 to meet the intent of the new Director’s Orders and the Federal Wildland Fire Management Policy and Program Review. Policies stated that park fire management programs will be designed to meet specific resources management objectives and to ensure that firefighter and public safety are not compromised. A fire management plan with a comprehensive environmental assessment will be developed.

The policies continued that all fires burning in natural or landscaped vegetation will be classified as either wildland fires or prescribed fires. Wildland fires will be effectively managed, considering resource values to be protected and firefighter and public safety, using a full range of strategic and tactical operations. Prescribed fires, which are ignited by park managers to achieve resource objectives,

will have monitoring of fire behavior, smoke behavior, fire decisions, and fire effects in order to determine whether specific objectives were met.

All parks will use a systematic decision making process to determine the most appropriate management strategies for all unplanned ignitions and for prescribed fires that are no longer meeting resource objectives. Superintendents will consider the full range of suppression strategies. Suppression methods for wildland fires should minimize impacts of the suppression action and the fire, commensurate with effective control and resource values to be protected.

Director's Order-18. In November 1998, the Director of the National Park Service approved the new Director's Orders-18 Wildland Fire Management (DO-18) (USDI National Park Service 1998b). Director's Order-18 incorporated the 1995 policy and program review by 1) institutionalizing within NPS the new policies, organizational and operational relationships, and changes in law and reporting requirements reflected in the report, and 2) establishing a framework by which the NPS will implement the report's principles, policies, and recommendations.

Reference Manual-18. Reference Manual-18 Wildland Fire Management (RM-18) is a technical discussion of wildland fire management requirements and procedures that provides detailed definitions and expanded guidance of all information presented in DO-18 (USDI National Park Service 1998a). Among other subjects, contents of RM-18 include guidance for safety, planning, qualifications, wildland fire and prescribed fire management, monitoring, and incident evaluation and review.

Bandelier National Monument Fire Program

Site Description. Bandelier National Monument is located in the southern portion of the Pajarito Plateau in the Jemez Mountains at the southern edge of the Rocky Mountains in north central New Mexico (USDI National Park Service 1997). The monument comprises 32,727 acres of area composed of volcanic ash deposits and lava flows that have been eroded into deep canyons. Elevations range from 5,300 feet to 10,199 feet. Prime archeological resources, which are noted in the enabling legislation, are remnants of the Puebloan People between 1100 and 1600 A.D.

The monument is bordered to the south, west, and northeast by the Santa Fe National Forest, to the north by the private lands of the Baca Ranch, and to the east by the Department of Energy Los Alamos National Laboratory (Figure 1). The communities of Los Alamos and White Rock are within five air miles to the east and southeast, respectively. Bandelier is a member of the Joint Powers Operating Plan, Santa Fe Zone, which provides for mutual aid initial attack of wildfires using the concept of closest available resources.

Fire Management Program. Forest communities cover most of the monument with high elevation grasslands occurring as breaks in the forest. Major communities are juniper grasslands, pinon-juniper, ponderosa pine, mixed conifer, and spruce-fir. Fire history studies showed frequent historic fires dating back four centuries throughout what is now monument land (USDI National Park Service 1997). The average fire frequency for all studies in the ponderosa pine-mixed conifer communities was one fire in 10 years during the 18th and 19th centuries. Lightning fires began in the early spring and peaked in late June to early July then decreased significantly as the summer rainy season progressed. Fire occurrence was drastically reduced starting in the late 1800s due to steadily increasing human settlement and land

uses. Suppression and land uses led to an increase in forest fuel accumulations, even-aged forest composition, loss of open forest structure, and decline of fire-dependent species. Fire behavior changed from predominantly lower to moderate intensity ground and surface fires with some crowning to great potential and occurrence of high severity crown fires.

The current Bandelier National Monument Wildland Fire Management Plan was approved in January 1997, and it was a revision of the first fire plan that was approved in 1986. The 1997 plan incorporated the principles, policies, and recommendations from the 1995 Federal Wildland Fire Management Policy and Program Review. An addendum to the fire plan in June 1997 described an agreement between NPS and US Fish and Wildlife Service about endangered species. Another addendum was done in June 1998 that changed the terminology in the fire management plan to the current usage in the 1995 Federal Wildland Fire Management Policy. The plan described operational details for conducting a comprehensive program of wildland and prescribed fire, safety, monitoring, research, education, and air quality.

The wildland fire plan prescribed actions to implement the Servicewide fire management policies and to achieve park resources management objectives. The four objectives stated in the plan are:

- Allow prescribed natural fires to function in fire-dependent ecosystem,
- Use prescribed fire to meet management objectives,
- Protect life, property, and park resources from the effects of unwanted fire, and
- Prevent adverse impacts from fire suppression.

Prescribed fire plans are subordinate to the fire management plan. They are prepared for each burn and have required elements as directed by RM-18. At a minimum, those elements include description of the area, goals and objectives, range of acceptable results expected, project assessment, implementation actions, cooperation, contingency plan, funding, smoke management, monitoring, and post-burn activities. The superintendent must approve plans before they are implemented.

CERRO GRANDE PRESCRIBED FIRE

Conducting a prescribed fire involves planning and implementation, and RM-18 is used as technical guidance (USDI National Park Service 1998b). The general steps to conduct a prescribed fire are:

- The park resources management plan identifies the need for wildland and prescribed fire and sets forth objectives.
- Fire management plan is written and approved with environmental compliance.
- Specific prescribed fire plans, which are subordinate to the fire management plan, are prepared for selected areas, and environmental compliance is confirmed for the site. The plan is reviewed by peers within the park. Other interested parties should be included in the review process, although that is not required.
- The prescribed fire plan is approved by the agency administrator.
- The burn site is prepared to keep the fire within the perimeters.
- Environmental and regional factors, such as weather, fuels, other fires, resource availability, etc., are tracked.
- Coordinate notification and implementation with other agencies and interested parties.
- Execute the fire and monitor behavior and effects.
- Prepare evaluation documentation.

Following are details about the preparation of the Upper Frijoles Units 1 and 5 prescribed fire plan written by Bandelier staff. Implementation describes the chronological account of the fire events from May 4 to 8 for ignition of the prescribed fire, fire behavior and weather changes, implementation of the suppression efforts, and efforts made to protect life and property. There are appendices relevant to this section. **Appendix 5** shows the staff position organization charts for Bandelier National Monument's park managers and resources management division. **Appendix 6** is a validation of prescription parameters used for the Upper Frijoles Prescribed Fire. **Appendix 7** is a summary of weather information for the Cerro Grande Prescribed Fire. **Appendix 8** is a discussion of the events leading to the escape of the Upper Frijoles Units 1 and 5 Prescribed Fire.

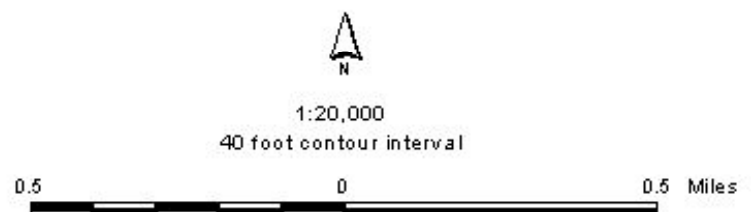
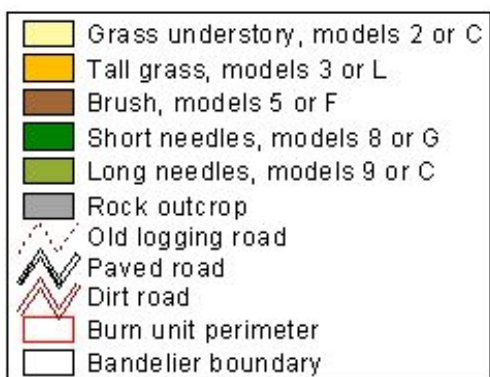
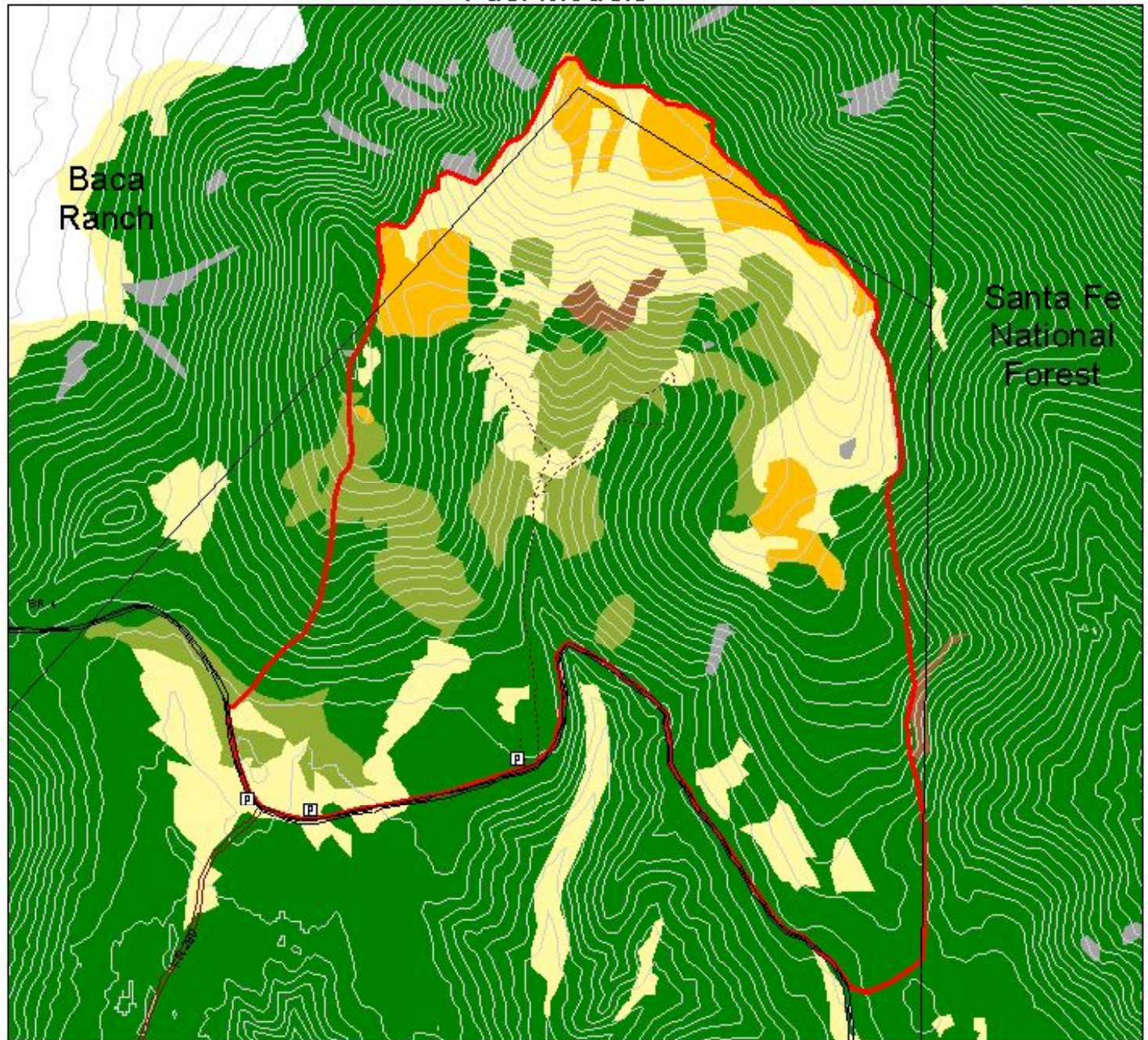
Planning

The Prescribed Fire Plan for the Upper Frijoles Creek drainage was originally signed and approved on April 19, 2000 (USDI National Park Service 2000b). On May 4, an amendment to the plan was signed and approved, which excluded private property on the Baca Ranch from the project area.

The Upper Frijoles Units 1 and 5 are in the northwest corner of Bandelier (Figure 2). They encompass 1,000 acres in the headwaters of Frijoles Creek above U.S. Highway 4 to the park boundary at the Cerro Grande summit. The vegetation in the area consists mostly of ponderosa pine-mixed conifer with some mixed conifer areas and montaine grasslands at the higher elevations (Figure 4). Included in the 1,000 acres is approximately 32 acres of the Baca Ranch.

The area within Unit 1 was burned in 1993. The fire was not as successful as planned, as much of the area within the burn unit was inherently moist and did not burn very well. Dead fuel loadings, from averaged plot information from the 1993 fire and the current prescribed fire were:

Figure 4
 Bandelier National Monument
 Burn Unit 1
 Fuel Models



Pre-1993 Burn Total Fueling Loading	34.4 tons/acre
Current Total Fuel Loading	29.0 tons/acre (84% of original)

The primary purpose of the project was to reduce hazard fuels in the burn unit, while allowing fire to be restored as a keystone natural process. With the exceptions of the grasslands, dry conditions were needed to accomplish fire objectives. The prescribed fire was to be accomplished in three phases. The first phase was to burn the upper part of the area that contained the grasslands. The second phase was to burn the timbered areas along the burn perimeter and drier aspects (usually south facing slopes) within the project area. This phase would occur shortly after or concurrently with the first phase. The third phase was to be delayed until extremely dry conditions develop that would allow for burning of the wetter areas. The third phase would most likely happen several weeks or even months after the initial burning.

Implementation

Following is a summary of events that became the Cerro Grande Prescribed Fire. Figures 5A through 5E show the initial ignition location and subsequent spread areas, while Figures 5F through 5I show the fire progression during days 1 through 4.

Thursday, May 4

The burn boss prepared the amendment to the prescribed fire plan, excluding the 32 acres of private land from the project. The park superintendent approved this amendment at 1300 hours.

The burn boss notified Santa Fe Zone Dispatch (Zone Dispatch) in the morning of the intent to implement the fire plan. The dispatcher expressed concerns about Bandelier conducting a prescribed fire when the Forest Service had already suspended prescribed fire activities on national forest lands and wildland fires were currently burning.

The burn boss and fire program assistant made notifications to the various agencies and individuals on the Bandelier prescribed fire notification list.

At 1830 hours, the holding boss notified Zone Dispatch of the prescribed fire. The burn boss conducted the prescribed fire briefing.

At 1900 hours, the holding boss called the National Weather Service confirming the winds in the spot weather forecast.

At 1920 hours, the test fire was ignited near the summit of Cerro Grande. Twenty fire personnel were on the scene. At approximately 2000 hours, the test fire was successfully completed, and the fire behavior was within expected parameters; the decision was made to continue the prescribed fire by the burn boss. They began the blackline by burning down the northeast edge of the fire from the test fire area. Progress was slow using the ignition pattern outlined in the plan. They changed the ignition

pattern to speed up the progress and the burn boss made a decision to stop suppressing the fire on the interior side of the ignition lines.

At about 2200 hours, ignition was completed on the northeast edge of the fire area.

The burn boss began walking back to the test fire area. Upon reaching it, the burn boss discovered the fire had burned through the blackline on the northeast and was burning southwest into the canyon faster than anticipated.

At 2200 hours, two additional firefighters arrived on the east side of the fire.

At 2300 hours, the ignition crew of three and a holding crew of 12 arrived back at the test fire area to suppress the fire burning outside the test fire.

At approximately 2315 hours, ignition began down the northwest edge of the unit.

Friday, May 5

At approximately 0100 hours, the crews reached the upper saddle and spent the next 1-1/2 hours bringing the fire back from the knob into the saddle, securing the line at 0230 hours.

Between 0100 and 0130 hours, the burn boss sent part of the Black Mesa crew down the mountain to get some sleep. At 0230 hours, five NPS personnel, the burn boss, the fire observer, and the remainder of the Black Mesa 10-person crew hiked down to the vehicles to get some sleep. The burn boss then left the fire, going to the office in the NPS housing area to order contingency resources.

At 0300, the burn boss called Zone Dispatch to order a Type 3 helicopter and a 20-person hand crew; he was told to call back in the morning. He also called the crew of Bandelier Engine 91 and asked them to come on duty at 0530 hours and go to the fire.

At 0600 hours, the burn boss and the fire observer began to determine the status of the ordered resources and contact key park staff regarding the fire situation. The holding boss updated the burn boss on the fire. The interior fire had backed below where the blacklining operations had stopped.

At approximately 0730, the burn boss reached Zone Dispatch, having tried since 0630 hours, to request a Type 1 20-person hand crew and a Type 3 helicopter. The dispatcher responded that he would need to check with others before filling this order. The dispatcher then called the park FMO and explained that the prescribed fire needed to be converted to a wildland fire so the requested resources could be obtained. The park FMO and the Zone Dispatcher reached agreement whereby resources would be ordered for a wildland fire currently burning on the national forest, but would be diverted to the prescribed fire.

At 1000 hours, the fire observer, the burn boss, and the holding boss discussed a change in command of the prescribed fire, as the burn boss needed sleep. The decision was made that the fire observer would now become the burn boss. Shortly thereafter, the holding crew on the northeast side reported fire slopover outside the line and they were having difficulty containing it. They requested water drops and

additional firefighters.

At 1030 hours, the Type 3 helicopter (H312) arrived, dropping off two personnel on the northeast side of the fire and departed to the helibase to pick up the bucket and begin water drops.

At 1100 hours, the Type 1 hand crew arrived at the fire. Five people went up the west line and 13 people went up the east line to the northeast side of the fire to assist in containing the slopover.

At 1255 hours, an air tanker was requested for the slopover on the northeast side and arrived an hour later. At this point, the burn boss made the decision to convert the prescribed fire to a wildland fire, which then became the Cerro Grande fire. The burn boss took over the fire as the Incident Commander (IC) and additional resources were ordered. Efforts then focused on suppressing the fire.

At approximately 1630 hours, a spot fire was detected one-quarter mile east of the main fire in Water Canyon, which the Type 1 hand crew contained. Another Type 1 hand crew arrived at the fire and started walking in.

At 1630 hours, the IC briefed park management on the Cerro Grande fire situation.

At 2115 hours, the Wildland Fire Situation Analysis (WFSA) was completed by the IC, the park Fire Management Officer, and the Chief of Resources Management and approved by the Superintendent.

At 2255 hours, Zone Dispatch requested the current fire weather observations to send to the National Weather Service (NWS). During the nighttime hours, crews began burning out the east handline (the part of a natural or constructed fire barrier that is scraped or dug to mineral soil) and improved the west saw line.

At 2355 hours, the NWS issued a spot weather forecast, calling for a fire weather watch on Saturday, May 6.

Saturday, May 6

During the nighttime hours, between 2400 and 0800 hours, one hand crew went off-shift, which left one hand crew on the fire to do fireline operations.

At 0230 hours, the hand crew began its blacklining operations along the east and west sides of the fire to stay ahead of the fire as it backed down the hill.

At 0728 hours, the hand crew requested an air tactical group supervisor, after a second spot fire was observed outside the fire area to the east, which was successfully contained.

During the daytime hours, the crew held the lines on the east and west sides of the fire, down to State Road 4.

At 1425 hours, the park Superintendent and key fire staff met with the interagency cooperators (Los Alamos National Laboratory, U.S. Forest Service and Los Alamos County) to discuss the suppression

strategy and tactics selected in the WFSA.

At 1846 hours, the crews continued firing operations to secure the handline along the east side of the fire. Progression was slow.

Sunday, May 7

At 0730 hours, the hand crew for the day operational period replaced the night crew on the east line and continued firing operations down to and west along State Road 4.

At approximately 0800 hours, air attack reported a spot fire on the park/forest boundary. By 1110, the spot was fully contained.

All burning operations along State Route 4 were halted at 1000 hours due to down slope wind conditions.

At 1150 hours, winds increased from the west and a spot fire occurred across State Route 4 into Frijoles Canyon.

At 1230 hours, the spot fire was growing rapidly and a Type 1 Incident Management Team and two Type 1 crews, two Type 2 crews, and one Type 3 helicopter were requested.

At 1240 hours, a decision was made by the IC to evacuate Graduation Flats and American Springs.

At approximately 1300 hours, interagency road closures and evacuation procedures were initiated. The Santa Fe National Forest Supervisor and Forest FMO were notified of these actions.

At 1450 hours, spot fires were reported along the eastside of the fire, increasing in intensity with the potential to threaten Los Alamos National Laboratory.

At 1700 hours, the spot fires in Frijoles Canyon were contained by the two Type 1 hand crews.

By 1700 hours, a spot fire to the east of the fire had grown to approximately 100 acres with additional spotting up to one-quarter mile ahead of the main fire.

At 1845 hours, a decision was made to burn out sections along State Route 501 and Forest Road 1 (Camp May Road) to protect the Los Alamos National Laboratory and the town of Los Alamos.

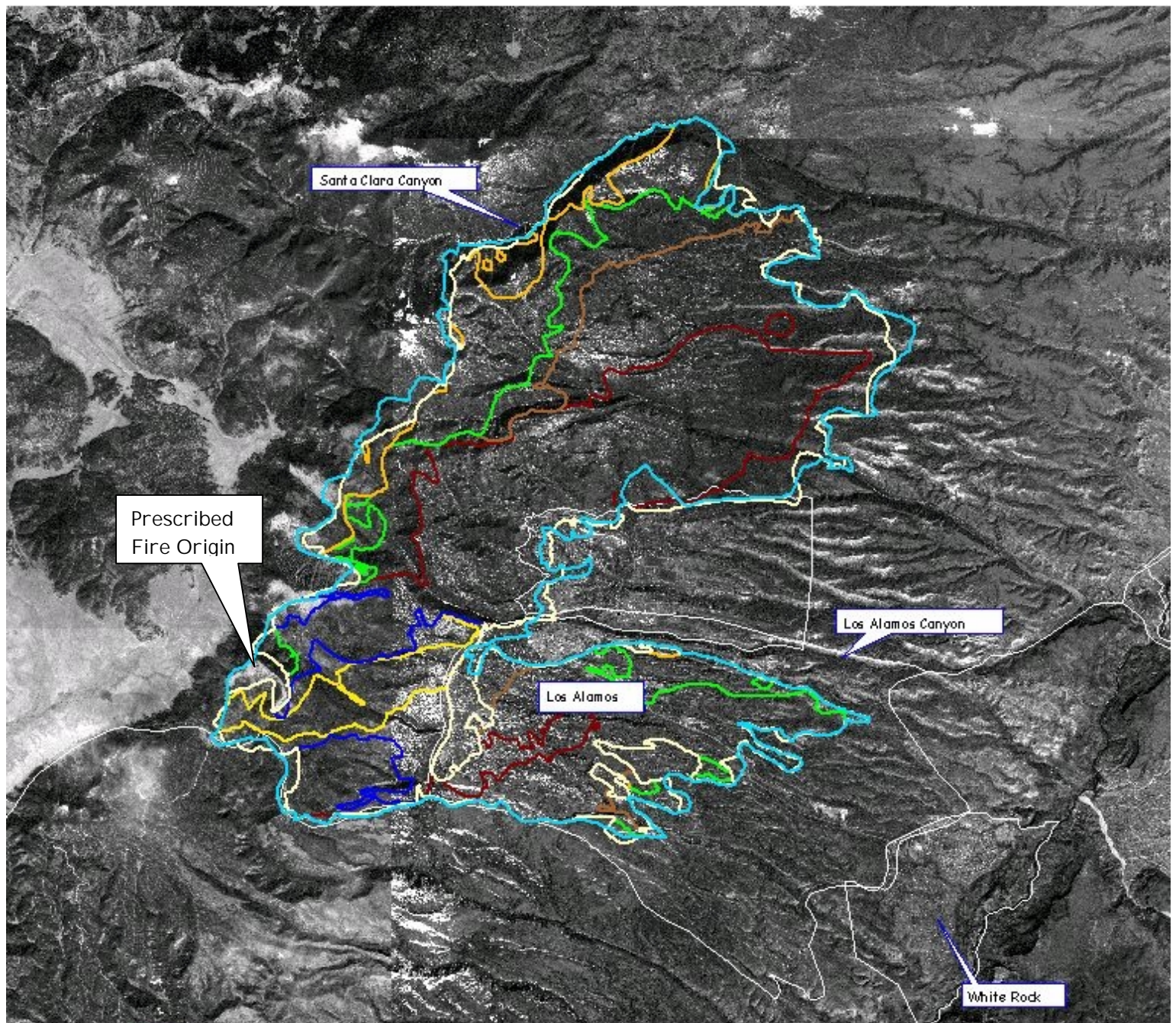
At 2100 hours, an interagency meeting was held to develop a unified command delegation of authority and a revision of the WFSA.

Monday May 8

At 0100 hours, the Type 1 Incident Management Team was briefed by the agency administrators and took over the fire operations at 0600 hours. (Fig. 6 shows the Cerro Grande Fire as of May 17, 2000.)

Figure 6

CERRO GRANDE FIRE IR MAPS MAY 8 -15, 2000 (IR TAKEN BY USFS)



- May 15 Midnight - 46,925 acres
- MAY 14 Midnight - 44,323 acres
- MAY 13 Midnight - 42,232 acres
- MAY 12 Midnight - 36,117 acres
- MAY 11 Midnight - 32,901 acres
- MAY 10 Midnight - 19,650 acres
- MAY 9 Midnight - 4,296 acres
- MAY 8 Midnight - 1,968 acres



8000 0 8000 16000 Feet

This map is for
informational purposes only.

